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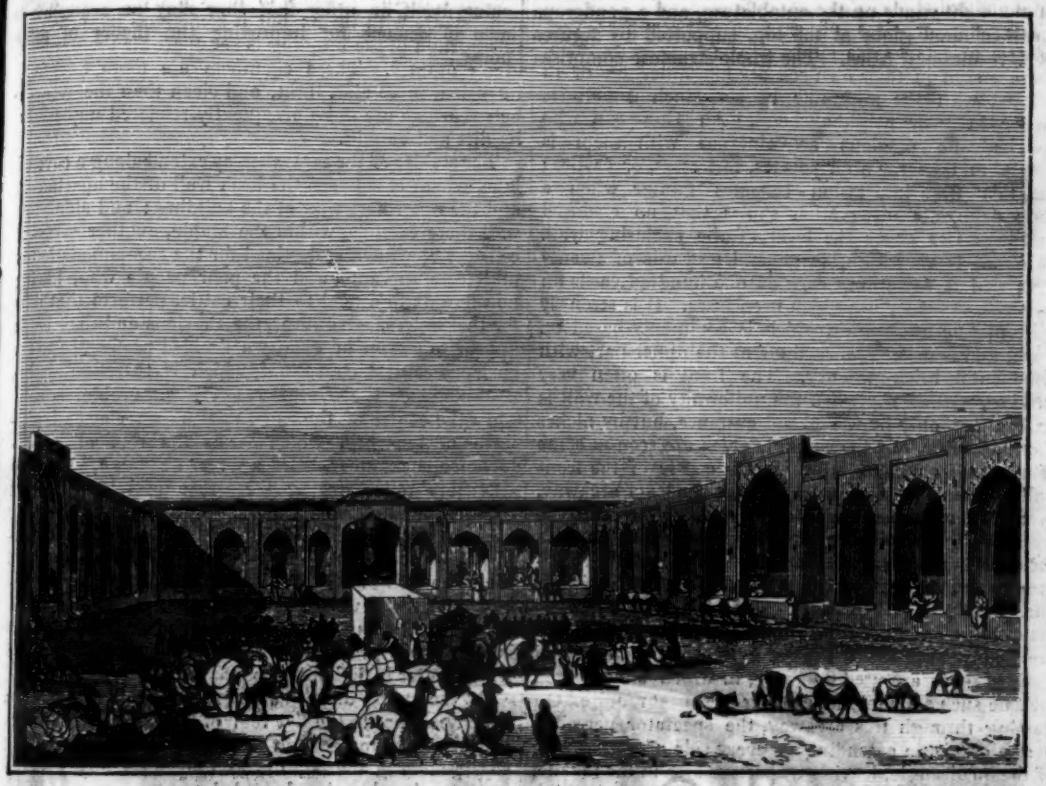
CARAVANSERAYS.



[Caravanseray.]

AMONG a rude people whose country is rarely visited by strangers, any one who arrives is cheerfully received into the tent or the hut of some principal man; and the best fare that the place can afford is set before him without charge. The rude or savage men sometimes even contend among themselves for the honour of entertaining the stranger. In a state of more advanced civilization and increased intercourse, so many sanctities come to be assembled around private life that the intrusion of a perfect stranger is felt unpleasant, and therefore a separate house is appropriated to the reception of travellers, where every attention is paid them, and they are amply supplied with provisions. In the next stage, hospitality provides only for the stranger what he cannot provide for himself,—shelter; and, in the last stage of all, in which occasion for travel is diminished to the poor and increased to the rich, the traveller is altogether left to the care of persons who make it a profession to afford him every kind of accommodation. Some persons look upon this last state of things as illustrating

"The cold charities of man to man"

in a highly civilized state of life. We, however, are quite satisfied that the actual amount of human sympathies is greatest in the state of society that is the most highly civilized; although sympathy and charity cannot always be exhibited in the same forms as in a ruder state of life, without disturbing the working of the delicate and complicated machinery in the midst of which the civilized man lives, and of which himself, his life, and his labours form a part. We proceed to describe the system of providing for travellers shelter, but no food, as exhibited in Persia.

The places of accommodation for travellers are properly three:—caravanserays, khans, and menzils. The first are buildings designed to afford shelter to travellers in deserts and other situations remote from towns; khans* are similar buildings in a town; and menzil is a word of rather indefinite application, but seems generally to denote the house of the persons who are accustomed to accommodate travellers in places where there is no khan or caravanseray. The difference between the two latter is not much attended to in common conversation; nevertheless, the terms are not so much confounded as might be supposed from the statement made by travellers,—that the public buildings devoted to their accommodation are usually called "khans" in Turkey and "caravanserays" in Persia. The reason is, that in Turkey there are, in fact, very few proper caravanserays,—that is, such buildings at a distance from towns,—while they abound in Persia.

In that country there are few public buildings comparable to the caravanserays, for the mosques are in general buildings of no external beauty; while in Turkey, where the mosques are often handsome structures, the buildings destined to accommodate travellers are ex-

* The word "khan," as applied to an inn, is a contraction of the word *khonch*, a house.

ceedingly mean. In our present paper we confine ourselves exclusively to caravanserays.

In Persia they are all constructed on essentially the same model, but they nevertheless differ greatly; and this difference is found not only in the materials and workmanship of the building, but in the absence of different parts possessed by the complete caravanserays. Our best course will be, first, to describe a perfect structure, and then to mention what parts are sometimes omitted.

The superior class of caravanserays appear very striking objects to the stranger who approaches them, whether seen in their own solitary magnificence, or in contrast with the miserable hovels which sometimes appear in their neighbourhood. An European who has had no previous acquaintance with them is certain to take them for palaces, fortresses, or castles; but this first impression becomes fainter when a more deliberate observation shows that no enclosed buildings rise above the level of the enclosing wall. This wall is very high, in general upwards of twenty feet; and it sometimes extends one hundred yards on each side of the square which it encloses. It is strongly built of fine brick-work, which is commonly based on stone, and is usually worked off at the upper part with ornamental brick-masonry. The front is often very striking, particularly when the uniformity of the wall is broken not only by the grand entrance, but by niches about four feet from the ground, which are seen in some of the best caravanserays. In the centre of the front wall appears the entrance, a tall and spacious archway, over which are sometimes chambers crowned with superb domes. Much pains have generally been taken with the open brick-work and mosaic of this part of the structure, which altogether forms a very fine and suitable portico to the caravanseray. On each side, under the extensively-arched roof of the portico, are rooms which are usually occupied by the keeper and his people; and some of them are used as shops, in which are exposed for sale such commodities as travellers most require. On passing through this archway, the spectator perceives a sort of piazza extending on every side of the interior of the quadrangle, leaving a spacious area in the middle. On a nearer approach, it appears that each of the high arched recesses separated by piers is an apartment, the floor of which is elevated three or four feet above the ground, and divided from the adjoining apartments by walls, the ends of which form what appear like the piers of a piazza. These apartments, which are open in front, are neatly paved, and sometimes possess a fireplace, while compartments cut out in the depth of the thick wall are serviceable as cupboards. A small door conducts to another more private room behind this. It is commonly of an oblong shape, with the chimney on the side opposite the door, at which the only light enters that the room receives. Along the walls, about three feet from the floor, there runs a line of such "topshehs," or cupboards, as we have just mentioned, and which are considered indispensable in all Persian apartments, but vary in depth from three inches to a foot. The inner apartment is seldom resorted to, not even for sleeping, except in winter or in bad weather, or by women, the outermost being considered the summer room, and an inhabitant of the East does not covet privacy for the purposes of sleep, eating, or devotion. In the middle of each of the three sides of the building, besides that in which is the entrance, or at least of the side immediately opposite the entrance, there is an apartment much more spacious and lofty than any other, in its actual structure, and appearing more so than it is, from not being divided into two rooms, as in the case of the common apartments. These large open chambers seem to have no specific use. They are sometimes occupied by families, and sometimes they are merely used as places to which the different inmates of the building resort to smoke their pipes together,—to converse, or to listen to tales. They seem to have been framed with the intention of rendering the other sides of the building uniform—in the interior view—with that which affords the entrance.

The vaulted chambers over the gateway, which are found in the oldest and best caravanserays, form the place of honour in such buildings. They are usually occupied by the persons of most note, particularly if females are with them: but it sometimes happens that this portion of the building is set apart for the purposes of an oratory. These chambers are more free from intrusion, more airy, light, and clean than the recesses below, which are not unfrequently rendered unpleasant by dirt and vermin.

The stables of the caravanseray extend along a covered lane, which is between the back wall of the apartments and the outermost wall of the building; and along this wall there extends, within the stable, another series of cell-like apartments, destined for the accommodation of muleteers, servants, and the poor people who, having no servants to attend to their cattle, perform that duty for themselves. However, the Persians and their cattle appear to concur in giving a decided preference to the spacious central court-yard, which is therefore used as a stable when the weather is not unfavourable.

In the centre of the court appears an elevated platform of masonry, which forms the roof of a subterraneous chamber called a "*zeera zemoun*," to which travellers retire during the great mid-day heats of summer, and which is then indeed a most refreshing retreat. Sometimes, however, the place of this platform is occupied by the circular or square parapet of the deep well or reservoir from which the caravanseray is supplied with water, the only accommodation, besides lodging, which such establishments provide, and which is sometimes provided at a great expense in situations where water is difficult to procure.

At the angles of the square there are flights of steps which conduct to the flat roof of the building, to which travellers like to resort in the cool of the evening; and very generally indeed, unless they have any valuable property in the chambers below, they remove their beds to the roof, and spend the night there.

We are not aware that any part of a complete caravanseray has escaped our notice, but must now state that such completeness is frequently wanting. Some caravanserays are destitute of the stables, and in others the apartments do not extend on all sides of the square. Many are without the domed chambers, or any chambers, over the gateway; many are without the "zeera zemoun," and in some the arcaded appearance of the interior is wanting;—a range of single chambers, such as are the inner chambers in the complete building, being merely fronted by an unbroken bench of masonry or earth.

As these buildings afford no other accommodation than the bare walls, and it is sometimes impossible to obtain food at any price in the neighbourhood, the eastern traveller is obliged to encumber himself with bedding, culinary utensils, and some articles of provision. The writer has even known wood for fuel bought at one stage to be used at the two or three following, where it was well known that none could be obtained. For the accommodation actually afforded no price is properly payable; and although a small gratuity seems to be sometimes expected from the better sort of travellers, it is understood not to be for the accommodation, but for attentions and services rendered by the persons in charge of the building. It may be that, in solitary situations, where they have no rivalry to apprehend, the people of the caravanserays may make a good profit by the sale of provisions; but that this is generally the

case, in such as are royal foundations, as some travellers allege, the writer is much inclined to doubt; for he never met with an instance in which the people of any village which might be in the neighbourhood were prevented from coming to hawk their goods about the caravanseray, and never observed that the traveller himself was ever hindered from going to make his market where he liked.

Caravanserays are doubtless of very ancient origin. Sir Robert Ker Porter quotes Xenophon as informing us that Cyrus was the first institutor of these resting-places. "For, observing how far a horse could well travel in a day, he built stables at those distances, and supplied them with persons to keep them in charge." A very large number of those now existing would appear to have been built by the great Shah Abbas; but it is so customary for Persians to refer to him as the founder of every structure for the public benefit concerning which they have no positive knowledge, that many more are attributed to him than he really erected. Many of the caravanserays are of royal origin; but we believe that in Persia the largest proportion have been built by wealthy individuals, either to perpetuate their names, or as acts of charity acceptable to God, and which will be abundantly recompensed in another state of existence. They are either built in such a manner as to be supposed to need no repair, or there are lands, or shops, or houses, assigned by the builder for the purpose, or it is left to the public spirit or charity of others to make the repairs. In general, however, unless the founder has provided for their being kept in a state of repair, they are allowed to fall into decay; because such persons as can afford it prefer to glorify their own names by building a new caravanseray, rather than to benefit the public by repairing several old ones. However, when strongly built, they long remain without visible decay; and under the pure and dry atmosphere of Persia retain for centuries the freshness of new buildings.

GAS.—No. II.

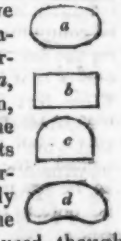
[Continued from No. 159.]

Manufacture of Gas.

Most persons have seen the experiment of making gas in a tobacco-pipe, by filling the bowl with coal, stopping it with a bit of clay, and putting it into the fire: in a few moments a smoke will be seen to come out of the end of the pipe, which, if a candle be applied, will take fire, and continue to burn for some minutes. This smoke is gas, and an extension of the process constitutes a gas apparatus. Instead of the pipe-bowl an iron retort is used, and an iron tube leading from it represents the stem of the tobacco-pipe. The first retort used by Mr. Murdoch was, in shape, not much unlike the bowl of the tobacco-pipe; it was cylindrical, and placed in an upright position, with a pipe leading from it to carry off the gas when formed. It held about fifteen pounds of coal, which was put in at the top; the cover was then fastened down, and the gas driven out through the small pipe at the side. But when the gas is made, there remains a large mass of coke in the cylinder, of greater bulk than the coal first put in, which must be removed before more gas can be obtained. The getting out of this coke was found to be a very troublesome operation with the retort upright. Mr. Murdoch in consequence employed the same retorts placed horizontally, or lying down on their sides; in this position it was easy to rake out the coke, though some difficulty was found in putting in the coal, which was afterwards obviated by using a long semi-cylindrical shovel. The horizontal retort succeeded perfectly; many contrivances have since been adopted, but none have been found to succeed so well, though the cylindrical form has been somewhat modified.

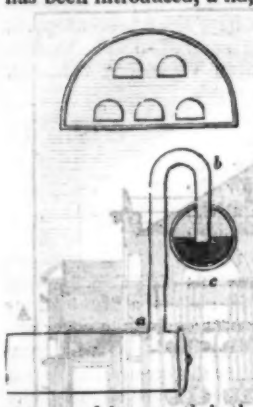
About 1804, an attempt was made to produce a retort that should be filled and emptied with equal ease; the form shown in the figure was used, as being well adapted for the purpose: the coal was put in at the top, *a*, the gas escaped through the pipe, *c*, and the coke was raked out at *b*. The object was answered; but the stopping of retorts is always a troublesome operation, from the necessity of keeping the cover air-tight, and, with all the care employed, gas will occasionally escape. In these retorts the inconvenience was doubled, and the plan was in consequence abandoned.

So great, however, was the convenience of the upright position for putting in the coal, that a cylinder was erected in this way at the establishment of Mr. Lee of Manchester, mentioned in a former Number, page 374: this cylinder was of greater size than any before used, holding fifteen hundred-weight of coals; and, to get over the difficulty of extracting the coke, an instrument called a grappler was used, consisting of a basket or grating of iron fitting into the bottom of the retort, in which it was placed previous to putting in the coal: the grating is suspended by iron chains, and drawn out with the coke by means of a crane as soon as the distillation is completed. This retort produced from 330 to 360 feet of gas for every hundred-weight of coal employed: the production was rapid at first, but towards the end of the operation it proceeded very slowly, because the coal first acted upon by the fire soon became coke, and formed a solid crust around the remaining coal, protecting it from the action of the fire, and checking its decomposition. A great heat and consequent consumption of fuel was therefore necessary to extract all the gas contained in coal by this large retort: and as it was ascertained by many experiments that where the production of gas was rapid its quality was better, and the quantity from the same measure of coal greater than when obtained slowly, it became evident that the preferable mode was to have the retort as small as convenient; but as a limit on this side was necessary, in consequence of the expense of frequently filling and emptying when very small, it was found, upon the whole, most convenient to use none smaller than sufficient to hold two bushels of coal. In order to have the coal as quickly acted upon as practicable, other forms were introduced; the circular cylinder was flattened to an oval, *a*, made square, *b*, flattened at the bottom, *c*, or doubly curved, *d*, as shown in the sections here given. In all these retorts the coal lies less in a mass than in the circular form, and is therefore more rapidly decomposed. The third form, called the "D-shaped retort," is now very generally used, though the cylinder still keeps its place in many establishments. A considerable practical advantage has resulted from the employment of these flattened retorts,—to such an extent that a hundred-weight of coal is found to produce only 370 feet of gas in a perfect cylinder, while in the D-shaped or oval forms from 450 to 500 feet may be obtained from an equal quantity.



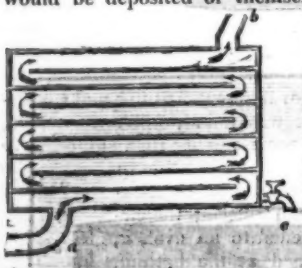
Whatever retorts are used, they are placed horizontally in ovens, in groups of three, five, or seven in each oven, according to the magnitude of the works. The mouth of each retort stands out of the oven, and, when the coal

has been introduced, a lid, or cover, is screwed on, well luted with mortar, to make it air-tight. Just behind the mouth a pipe is fitted, *a*, leading upwards, and then turning down with a sudden bend, *b*, when it dips into a much larger pipe called the "hydraulic main," *c*. The main runs through the whole of the retort-house, just above the line of ovens, in an horizontal direction, and is generally half-full of tar and water, which are produced with the gas. The pipe from the retort dips a few inches into the tar and water, and its mouth is thus closed against the return of gas, which might otherwise take place when the supply grew slack and the retort cool. The fuel used in heating the retorts is principally the coke produced in gas-making. The tar also is sometimes mixed with ashes, and burned as fuel.

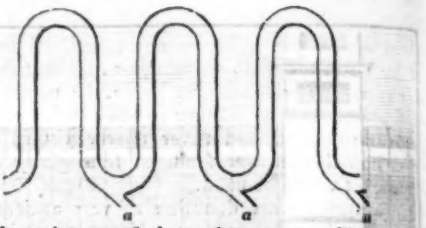


In the engraving in the next page, which is a section of one of the principal establishments in London, showing the internal arrangements in their most complete state, the retorts are placed in groups of five in each oven. A pipe is seen leading from each retort to some height above the hydraulic main, which is the great tube running across the whole of the retort-house, only half of which is shown in the engraving. The works being viewed in front, the dip of the pipe into the main cannot be seen.

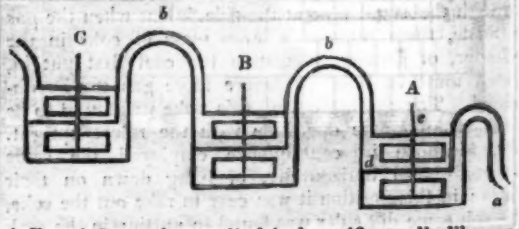
But the gas produced by the tobacco-pipe or by the retorts is far from being the fine and invisible air used in lighting the shops and streets of London: it is a thick, oily smoke, of disagreeable smell, which requires much purification before it is fit for use. Oil, water, tar, and various gases are produced with coal-gas, and must be separated. In the early days of gas-making it was found an easy matter to get rid of the water, oil, and tar. Nothing more was necessary than to pass the gas through water, and to allow it a sufficient time to repose, when all these impurities would be deposited of themselves. This part of the operation was performed in the early apparatus by admitting the gas into a square vessel, or cistern, filled with water and divided with shelves, as in this figure. The gas entered the cistern at the pipe marked *a*, and was compelled by the shelves or partitions to traverse the water several times in the direction represented by the arrows, in which course it was well washed; the cleansed gas came out at the pipe *b*, and the accumulated impurities, which were deposited at the bottom of the vessel, were drawn off at the stop-cock *c*.



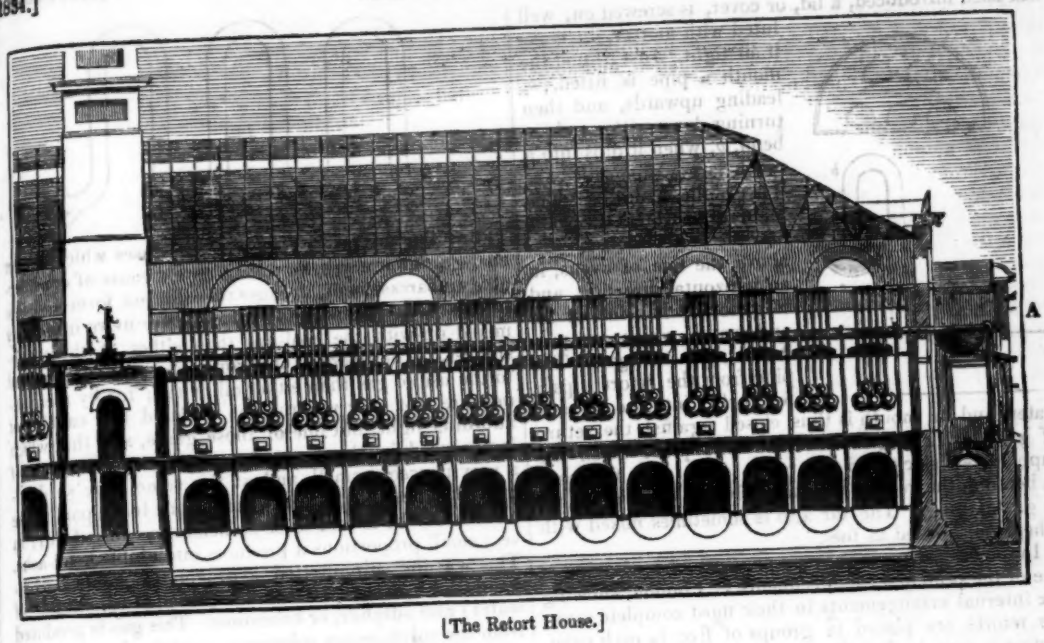
This part of the apparatus was called the "condenser," because the gas, which entered it in a heated and rarefied state as it left the retorts, was rendered cool and dense as it passed through. The condenser now usually consists of a succession of iron tubes, bent as in the figure, through which the gas passes as it leaves the hydraulic main. At each lower bend a pipe, or syphon, *a*, *a*, *a*, is fixed, through which the deposited tar, &c., is drawn off; and sometimes the condenser is surrounded with cold water, to cause a more rapid deposition.



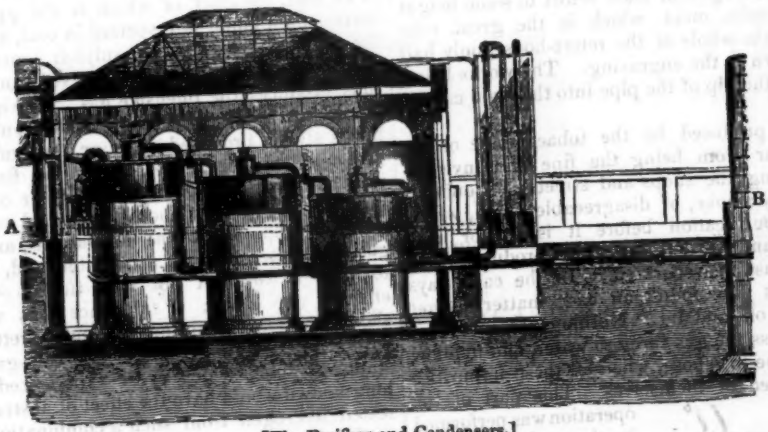
But the mixture of the various gases which render coal-gas impure was, for a long time, a cause of considerable embarrassment, because they did not form a visible impurity, like the oil and tar, and were more intimately mixed up with the coal-gas than either of those substances. They were at the same time more detrimental to the use of gas than either oil or tar; for by their admixture not only was the gas rendered less capable of affording light, but one of those gases, and that which is produced in the greatest quantity, was the cause of a very nauseous smell, and at the same time so detrimental to health, that a mixture of one tenth part in the air we breathe is said to be sufficient to cause death: in very small proportions it produces intolerable head-ache. This was the sulphuretted hydrogen, a chemical compound of hydrogen (which is a principal constituent of water) and sulphur, or brimstone. This gas is produced from the sulphureous substances contained more or less in all coal, the chief of which is the pyrites, or yellow leaves, often found interspersed in coal, and mistaken by the ignorant for gold: the sulphur contained in pyrites combines with the hydrogen evolved from the coal, and thus produces the offensive gas. The quantity of this gas formed varies exceedingly in different kinds of coal, but is always produced more or less, and a knowledge of chemistry not possessed by the first gas-makers was necessary to get rid of it. Their only means appear to have been to choose such coal as produced the smallest proportion of the noxious gas, and to wash the gas with water as much as possible, and, in some cases, to pass it through hot iron tubes. These means effected very little; a substance was wanted which should possess an affinity for sulphuretted hydrogen, without at the same time affecting coal-gas. This substance is lime, which every experienced chemist had long known would have the effect of abstracting sulphuretted hydrogen from such a combination. The very mode of applying the lime which is now practised was suggested by Dr. Henry, of Manchester, as early as 1808. The manner of applying the lime was to mix it with water into a semi-fluid mass, which was called the "cream of lime;" through this mixture the impure gas was driven; the lime exerted its attractive influence on the sulphuretted hydrogen, and the coal-gas passed out pure. To prevent the lime from falling to the bottom of the vessel, an agitator was introduced, which kept turning round and stirring up the thick mass, which it retained in an uniform state. This plan was found to answer perfectly well, and to this day no better means have been discovered. Several of these purifiers are employed in large works, through all of which the gas passes in succession before it is quite pure. The following sketch will show how this is effected in the best establishments:—



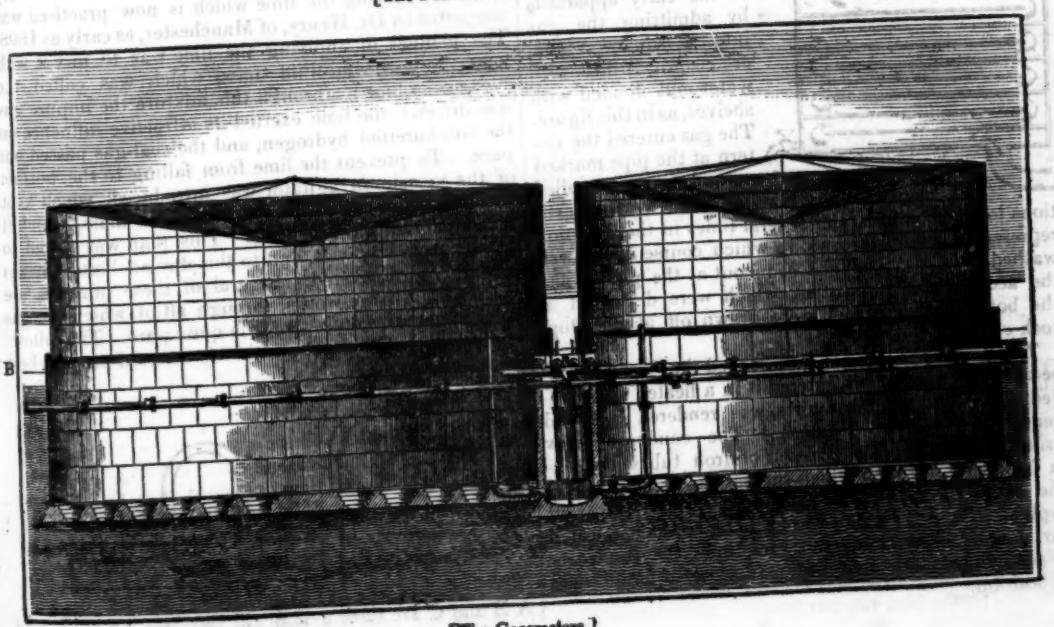
A B and C are three cylindrical purifiers, all alike, and



[The Retort House.]



[The Purifiers and Condensers.]



[The Gasometers.]

all filled with the half-fluid lime. The impure gas is first forced into the lowest vessel A, through the pipe *a*, by which it is conveyed under the shelf *d*, and spread through the lower half of the vessel, after which it escapes through small holes in the shelf to the upper part. All this time the cream of lime has been kept in constant motion by the agitator *e*, which is continually turned round, either by a steam-engine or some other moving power, and the gas is of course kept as much in contact with it as practicable. When the gas escapes from the vessel A by the pipe *b*, it enters the vessel B, where it undergoes precisely the same process as in the vessel A, and is still further purified; but lest any small remains of impurity should still exist, it is afterwards passed by the pipe *c* through the third vessel C, from whence it issues quite pure. This effect, however, is not produced, unless the lime be changed from time to time, because a certain quantity of lime is able to take up only a certain proportion of sulphuretted hydrogen, and that quantity being taken up, any future proportion of impure gas will pass out in the state in which it entered. In the present apparatus, the change of lime is almost constantly going on. The stuff is mixed in a vessel above the purifier C, into which it descends by its own weight through a pipe not seen in the figure; from C it flows into B, from B to A, and from A to a reservoir, where it is retained until otherwise disposed of. The cream is in its pure state when it enters the vessel C, and as the gas is in an almost pure state when it reaches the same vessel, the cream flows into B not much altered. In this vessel it loses much of its purifying power, and in A it is retained until it is quite saturated. By this ingenious arrangement the lime is rendered useful to the last, the gas always leaves it in its most effective state, and is consequently less liable to carry off any impurity. To judge of the purity of the gas, the most usual way is to wet a white card with a solution of sugar of lead, and to expose the card to a jet of the gas to be examined. It is a property of sulphuretted hydrogen to form with lead an insoluble dark-coloured compound; if, therefore, any of this noxious gas be present in the coal-gas, it will form this compound by combining with the lead upon the card, and produce a brown spot. When this is the case, fresh lime is placed in the purifiers, and the effete saturated stuff drawn off*.

In the principal engraving, the purifiers and condensers are shown in the second portion, which is divided from the first and third for want of room, although in fact all three portions form but one line. The gas is brought to the condenser on the right by a continuation of the hydraulic main passing behind the purifiers, and of course invisible in the figure. The tube leading from the condensers to the lowest purifier is seen, as well as those which convey the gas and lime from one purifier to the other. The vessel in which the "cream" is mixed appears, in the first division, just behind the hydraulic main. The pipe which conveys the purified gas runs all across the second portion of the engraving to the gasometers in the third division, the construction and use of which will be explained in a subsequent Number.

The saturated lime has a very nauseous smell, and was for some years a cause of great annoyance to the neighbourhood of gas-works. When thrown away to evaporate in cess-pools, or to run to the river through the common sewers, the surrounding atmosphere was polluted with the noisome stench, or the water poisoned for many miles down the river. Legislative interference corrected this nuisance. The exposure of the sulphuretted lime was prohibited, and it is now a usual practice to evaporate the water in reservoirs under the heated retorts, and to use the lime as a mortar or cement to fasten on the stoppers of the retorts, when filled with coal, so as to prevent the escape of the gas.

The proportion of sulphuretted hydrogen gas varies with the quality of the coal employed, and the quantity of lime required to purify a given quantity of coal-gas will, of course, vary accordingly. It is stated that the most impure gas may be purified by a quantity of lime equal in weight to a tenth of the coal from which it was produced, while for better coals one-third of that quantity will be sufficient.

[To be continued.

* That the coal-gas may leave the purifiers as free from admixture as possible, the test is usually applied to the vessel marked B; and although, from the efficiency of the test, the impurity cannot amount to $\frac{1}{10,000}$ part, the whole of the gas, after this, passes through the third purifier filled with pure lime.

Houses in Otaheite.—The houses are mostly built along the sea-shore, without the least regard to regularity or the formation of a town; indeed, intercourse with foreigners is not sufficiently extensive to point out the necessity of the latter. I was not a little surprised that they had gained no idea of comfort in their dwellings,—not attempting to make the slightest alteration in the style, although they have the example of Europeans before their eyes. Their huts are constructed of bamboos, placed perpendicularly, at the distance of one and a half or two inches from one another, and five feet in height, over which a roof is erected and thatched with the leaves of the cocoa-nut or palm-tree. These huts seldom possess any other furniture than a few wooden bowls and a sort of platter, on which the natives beat up the bread-fruit. One house commonly serves more than one family, although it is not divided into apartments: in some a bedstead may be seen, fixed in the ground, and which, instead of sacking, has a sort of netting, worked with line made of the *poorou*. The floors are strewed with dried grass; and, as the people are not careful to change it often, cleanliness is not a very prominent feature in their habitations.—*MS. Journal of a Voyage.*

SILVER COINS FOUND AT TUTBURY, IN STAFFORDSHIRE, IN JUNE, 1831.

WHOEVER has travelled from Derby to Uttoxeter must have observed, when he has got about nine miles on his road, some fragments of ruins on a commanding eminence, at the distance of about a mile and a half on his left hand. Those fragments are the sole remains of the once regal castle of Tutbury, the favourite residence of the Earls and Dukes of Lancaster, the prison of the beauteous but ill-fated Queen of Scotland and the scene of many historical events.

The hill on which the castle stands is an immense rock of alabaster, or of what is more properly denominated gypsum. Its height gives it the advantage of a very extensive prospect over a country comparatively flat, and which is only bounded by the distant mountains of the Peak of Derbyshire. Towards its own county, that of Stafford, the view is confined by the rising grounds of what once was Needwood Forest, and which at a distance still retain their former character, being well covered with trees, which form a pleasing back-ground to the scene. At the foot of this rock runs the river Dove,—here the boundary of Staffordshire and Derbyshire,—and over it is a fine stone bridge of five arches, newly erected, instead of the old narrow inconvenient one, which, till within these few years, was the only road to the town.

To give a succinct history of Tutbury Castle would be only to present, in another form, a great part of the history of the nation, so much has it been mixed up with the most remarkable events of many reigns. Whether the aborigines or the Romans had or had not a castle here is what no antiquarian will venture to decide, but all agree that during the Heptarchy the Saxons had one, and that it suffered much, if it were

not totally destroyed, by the Danes. After the Conquest, Tutbury became the property of Henry de Ferrarius, a Norman, who rebuilt the castle, and made it much more capacious than it had been before, and in its immediate neighbourhood founded a priory, the only remains of which is the present parish-church, which, in its great west door, presents one of the most rich and beautiful specimens of the architecture of the latter part of the eleventh century now to be met with in Britain.

It is the general lot of great possessions frequently to change their owners: thus we find that Tutbury was forfeited, among his other possessions, by Robert de Ferrers, Earl of Derby, in the year 1269, and was given by Edward I. to his brother Edmund, Earl of Lancaster, who dying in 1297, it became the property of his son Thomas, the second Earl of Lancaster, who repaired, beautified, and improved the castle, making it in a great measure his general residence.

The Earl of Lancaster, however, in a short time found himself embroiled with the next sovereign, Edward II. Disgusted with the manner in which Edward suffered himself to be guided by his successive favourites, Gaveston, and the two Spensers, and pitying the people who were the victims of his rapacity, and partly instigated by his own private wrongs, he, at the head of a number of barons, first remonstrated with, and afterwards took up arms against, his sovereign. A civil war was begun which was vigorously carried on on both sides. The king had advanced into the heart of the kingdom while the earl was in the north, and before the latter could stop its progress, the royal army had penetrated the country, and advanced nearly to Burton in Staffordshire. Here however the earl arrived before the king, and, taking possession of the town, determined to prevent the king from entering.

Burton is situated on the western bank of the river Trent, which is here remarkably deep, and of such a breadth as to require a bridge of a quarter of a mile in length to connect it with the neighbouring county of Derby, and to open a communication with the adjoining towns of Leicestershire. This bridge is very narrow and very crooked, full of angles and projections, and so contrived, that but few persons can pass abreast over it; at that time it was less commodious than at present, for independently of the chapels which at that period formed a component part of every bridge, it had a number of other buildings at the ends, and towards the middle. Thus situated it was easily guarded, and Earl Thomas determined to dispute the passage to the last extremity. On this bridge he considered his safety to depend, for without crossing the Trent, he knew that his castle of Tutbury could not be approached, and there was no other bridge within many miles. Confiding in his situation, though deserted by the barons who had promised him assistance, he was not a little surprised when part of Edward's army attacked his forces in the rear, having, by means of a guide, found a ford about five miles above Burton, by which they had crossed the river, while the other part remained near the bridge, apparently with a determination of forcing a passage, as a feint to draw off the earl's attention to the real quarter of attack. The earl was now obliged to fly to the only refuge he had left, his apparently impregnable fortress of Tutbury.

Tutbury is only about five miles from Burton, and scarcely had Lancaster got into the castle with the remnant of his followers, when he found the royal forces were at the gates. To stay was not possible, to come out on the Staffordshire side impracticable, and the river Dove, at that time scarcely fordable, and over which there was not then any bridge, appeared completely to cut him off from entering Derbyshire, and passing through that county to his castle of Pontefract in Yorkshire. This, however, he was under the necessity of attempting, and after leaving his baggage and military chest in the care of his treasurer Leicester, with directions to convey them in safety as soon as possible to Pontefract, he and his followers made the attempt, and, in spite of the high floods, succeeded.

Such was not the fortune of the military chest, the sole treasury of the unfortunate earl, the contents of which he had been long amassing to pay his troops and discharge the current expenses of the war. Leicester did his utmost to preserve it, but in the confusion of crossing the river in the dark, with a guard which was as it were panic-struck, the chest with all its contents was lost in the Dove, nor had the treasurer ever after an opportunity of returning to attempt its recovery.

A few words will suffice to complete the history of the adventurous earl. He found himself deserted by those on whom he placed dependence, and was finally betrayed into the hands of his enemies, who conducted him to Pontefract, where, after suffering the greatest indignities, as is generally the case with fallen greatness, his head was struck off in the latter end of March or beginning of April, 1322

Of the immense sum of money thus deposited in the bottom of the Dove, astonishing as it may seem, nothing was known or heard till the month of June, 1831. Two bridges had been built, a corn-mill erected, and subsequently a cotton-mill, weirs and dams had been formed, and many cuts and alterations made in the river, without this treasure having ever been brought to light: when, on the 1st of June, the proprietors of the cotton-mills having commenced the operation of deepening the river, for the purpose of giving a greater fall to the water from the wheel, the workmen found among the gravel, about threescore yards below the bridge, a few small pieces of silver coin, of such a kind as they had never seen before.

Sir Oswald Mosley, Bart., in his recent 'History of the Town and Houses of Tutbury,' as a supplement to the history of Thomas, Earl of Lancaster, in the former part of his work, gives the following account of the finding of these coins:—

"Mr. Webb, the proprietor of the cotton-mills at Tutbury, being desirous to obtain a greater fall for what is commonly termed the tail water of the wheel, which works the machinery of his mill, prolonged an embankment between the mill-stream and the river much farther below the bridge than it formerly extended; and, as a part of his plan, it became requisite to wheel a considerable quantity of gravel out of the bed of the river, from the end of his water-course as far up as the new bridge. While they were engaged in this operation, on Wednesday, the 1st of June, 1831, the workmen found several small pieces of silver coin about sixty yards below the bridge; as they proceeded up the river they continued to find more; these were discovered lying about half a yard below the surface of the gravel, apparently as if they had been washed down from a higher source. On the following Tuesday the men left their work in the expectation of finding more coin, and they were not disappointed, for several thousands were obtained that day; as they advanced up the river they became more successful; and the next day, Wednesday, June the 8th, they discovered the grand deposit of coins, from whence the others had been washed, about thirty yards below the present bridge, and from four to five feet beneath the surface of the gravel. The coins were here so abundant, that one hundred and fifty were turned up in a single shovelfull of gravel, and nearly five thousand of them were collected by two of the individuals thus employed on that day; they were sold to the by-standers at six, seven, eight, or eight shillings and sixpence per hundred; but the next day a less quantity was procured, and the

prices of them advanced accordingly. The bulk of the coins were found in a space of about three yards square near the Derbyshire bank of the river. Upwards of three hundred individuals might have been seen engaged in this search at one time, and the idle and inquisitive were attracted from all quarters to the spot. Quarrels and disturbances naturally enough ensued, and the interference of the neighbouring magistrates became necessary. At length the officers of the crown asserted the king's right to all coin which might subsequently be found in the bed of the river, since the soil thereof belonged to his majesty in right of his duchy of Lancaster. A commission was issued from the chancellor of the duchy, prohibiting all persons, excepting those appointed therein, from searching, or authorising others to search, for coin in the river; and for the purpose of insuring the king's rights, the commissioners were directed to institute a further search on behalf of the crown, which search commenced on the 28th of June, and was discontinued by them on the 1st of July, after having obtained under it upwards of fifteen hundred more coins, which were forwarded to his majesty and the chancellor of his duchy. At the end of this search, the excavation, from whence the coins were principally taken, was filled up, and a quantity of gravel spread over it for the purpose of levelling the bed of the river, so that any further search would now be quite ineffectual. The total number of coins thus found is supposed to have been, upon the most moderate computation, one hundred thousand."

The crowds who assembled from the neighbourhood to hunt after this treasure were naturally very great. Those who found a coin had much difficulty in detaching it from the gravel in which it had become imbedded. Having been for such a succession of years lying amid the soil which once formed the bed of the stream, and on which the water had gradually deposited stratum upon stratum of sand and gravel, the mass had become a hard substance, scarcely yielding in solidity to stone itself, in which coin upon coin appeared to form some of the original component parts. A representation of a fragment of this conglomeration, happily preserved from destruction by purchase from the finder, forms the vignette at the end of this article; and, to a stranger, may convey some little idea of the manner in which the coins were deposited.

The annexed engraving is a specimen of one of the most curious and perfect of the coins, from which an idea may be formed of the nature of the rest. Besides a number of sterlings of the Empire, Brabant, Lorraine, and Hainault, and the Scotch coins of Alexander III., John Baliol, and Robert Bruce, there was found a complete English series of those of the first Edward, who, at various times, had his money struck at the following places, viz.:—London, York, Canterbury, Chester, Durham, Lincoln, Bristol, Exeter, Berwick, St. Edmunds, Kingston, and Newcastle; and also of those he had struck at Dublin, Waterford, and Cork. There were also found specimens of all the prelatical coins of Edward I. and Edward II., as of Bishops Beck, Kellar, and Beaumont, Bishops of Durham; some others, thought to have been struck by the Abbot of St. Edmunds, bearing upon them the name of "Rob. de Hadley," and a few issuing from the archiepiscopal see of York. Besides those enumerated, there were many of Henry III., both of his first and second coinage, and a few of the most early of Edward II. On the whole, a finer museum of early English, Scotch, and Irish coins was never before, under any circumstances, thrown open to the inspection of the antiquary and historian.

It seems, upon the whole, rather surprising that the English coins found should all have been of the same size and value, which, with one single exception, seems to have been the case. This exception was a very beautiful coin of silver, of about the size of a half-crown, and of the reign of Edward I. Nor is it less surprising that the chest should have contained no jewellery, or other valuable articles, one ring alone being found in the river, which was probably lost by some one of the Earl's officers in fording. It was rudely chased, and bore within the circle the motto "Spreta vivant"

[Representation of the Coins as Found at Tutbury.]

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.
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